

UNITED STATES DISTRICT COURT  
DISTRICT OF NEW JERSEY

**RAZOR USA LLC AND SHANE CHEN,**

*Plaintiffs,*

v.

**DGL GROUP, LTD.,**

*Defendant.*

Civil Action No. 19-12939  
(JMV) (MF)

**OPINION**

**John Michael Vazquez, U.S.D.J.**

In this patent infringement case, Plaintiffs Razor USA LLC and Shan Chen allege that Defendant DGL Group Limited infringed upon Chen’s patent for a “Two-Wheel, Self-Balancing Vehicle with Independently Movable Foot Placement Sections,” commonly called a hoverboard. Following the claims construction (or *Markman*)<sup>1</sup> hearing, the Court now construes the disputed claims in the patent at issue. The Court reviewed the parties’ submissions, including their Joint Claim Construction and Prehearing Statement, D.E. 37; each party’s Opening Markman Brief, D.E. 63, 85; and each party’s Markman Response Brief, D.E. 87, 88.<sup>2</sup> The Court also reviewed the parties’ supplemental statement of authorities. D.E. 129, 130.

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<sup>1</sup> See *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996).

<sup>2</sup> Plaintiffs’ Opening Markman Brief will be referred to as “Razor Br.,” D.E. 85. Defendant’s Opening Markman Brief will be referred to as “DGL Br.,” D.E. 63. Plaintiffs’ Markman Response Brief will be referred to as “Razor Resp. Br.,” D.E. 88. And Defendant’s Markman Response Brief will be referred to as “DGL Resp. Br.,” D.E. 87.

## **I. BACKGROUND**

### **a. Current Patent**

Plaintiff Chen filed a reissue application for the relevant patent, RE46,964 (hereinafter RE964 or the “Patent”), on May 26, 2016. D.E. 63-2 at 2. The Patent was reissued on July 24, 2018. *Id.* RE964 reflects an improvement on two-wheel, self-balancing vehicles by providing independent wheel control through two independently movable platform sections or areas. More precisely, the Patent provides that “[t]he present invention relates to two-wheel, self-balancing vehicles and, more specifically, to such vehicles with two platform sections or areas that are independently movable with respect to one another and that thereby provide independent control and/or drive of the wheel associated with the given platform section/area.” RE964, 1:23-28. The invention is commonly referred to as a hoverboard. DGL Br. at 2; Razor Br. at 4. RE964 is a reissue of a previous patent, 8,738,278 (the ‘278 Patent), which was filed on February 11, 2013 and issued on May 27, 2014. D.E. 63-2 at 2.

RE964’s specification refers to “[a] first group of prior art two-wheel self-balancing vehicles,” which is “represented by a product known commonly as the ‘Segway.’” RE964, 1:32-34. The specification continues to describe the disadvantages of the Segway – it is large, heavy, and expensive, and its tall handlebar structure “is a trip hazard when a user makes an unplanned exit from the vehicle.” *Id.* at 1:36-43. The figure included below – Figure 1 of Patent 6,302,230 (the “Segway Patent”) – shows a woman using a Segway.

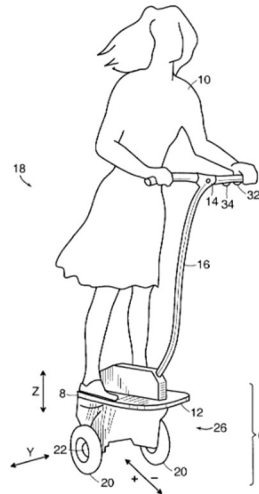


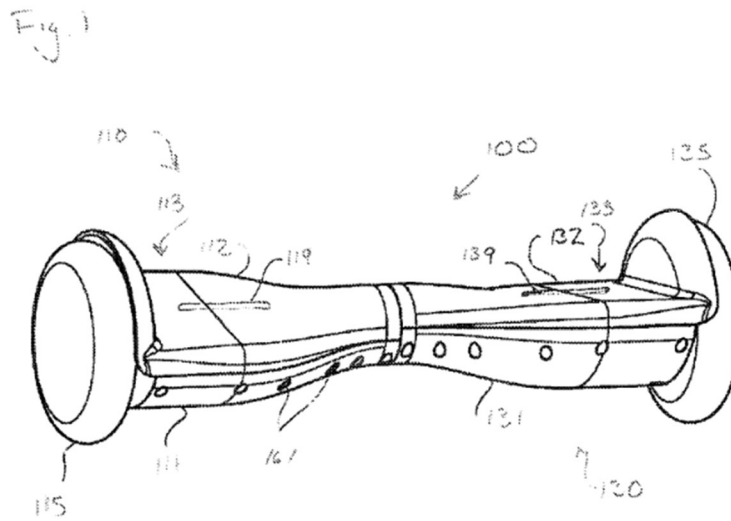
FIG. 1

The Patent's specification also recognizes "[a]nother group of prior art two-wheel self-balancing vehicles," which have two platform sections that "move in a linked or 'dependent' manner." RE964, 1:44-50. According to the specification, vehicles in this group also suffer from disadvantages due to their lack of independent wheel control. The componentry required to "coordinate/link movement of the two platform sections and the wheels" adds weight, bulk, complexity, and a potential for mechanical failure, and the turning radius is "fairly large." *Id.* at 1:56-62.

As a result of these disadvantages, RE964 identifies a need

for a two-wheel self-balancing vehicle that provides independent wheel control, is light-weight and compact, is easy and safe to use, and that may be made in a cost-effective manner. A need also exists for a two-wheel self-balancing vehicle that is more maneuverable and more ergonomic (functioning more naturally with the bio-mechanics of a user's legs and body) than prior art devices.

*Id.* at 1:63 to 2:2. The Patent includes the figure depicted below, entitled Figure 1, which is described as "a perspective view of a two-wheel, self-balancing vehicle with independently movable platform sections in accordance with the present invention." *Id.* at 2:36-38.



RE964 includes seventeen claims, two of which (claims 1 and 10) are independent claims.

Claim 1 provides that the claimed invention is

[a] two-wheel, *self-balancing vehicle* device, comprising: a first *foot placement section* and a second *foot placement section* that are coupled to one another and are *independently rotatable* along an axis passing through a first wheel and a second wheel; said first wheel associated with the first *foot placement section* and said second wheel associated with the second *foot placement section*, the first and second wheels being spaced apart and substantially parallel to one another; a first position sensor and a first drive motor configured to drive the second wheel; and *control logic* that *drives* the first wheel toward self-balancing the first *foot placement section* in response to *position data* from the first sensor and that drives the second wheel toward self-balancing the second *foot placement section* in response to position data from the second *foot placement section*.

RE964, 5:14-36 (emphases added). The emphasized terms are those disputed between the parties.

Claim 10 claims the following, with the disputed terms emphasized:

A two-wheel *self-balancing vehicle* device, comprising: a first *foot placement section* and a second *foot placement section* that are coupled to one another and are *independently rotatable* along an axis passing through a first wheel and a second wheel; said first wheel associated with the first *foot placement section* and said second wheel associated with the second *foot placement section*, the first and second wheels being spaced apart and substantially parallel to

one another; a first position sensor and a first drive motor configured to drive the first wheel a second position sensor and a second drive motor configured to drive the second wheel; and *control logic that drives the first wheel toward self-balancing the first foot placement section* in response to *position data from* the first sensor and that drives the second wheel toward self-balancing the second *foot placement section* in response to position data from the second sensor.

*Id.* 6:10-31 (emphases added). Claims 1 and 10 are similar except that the final lines of claim 10 use the language “data from the second sensor,” while the final lines of claim 1 use the language “data from the second foot placement section.”

Below is a chart of the disputed terms, along with each parties’ proposed constructions, taken from the parties’ Joint Claim Construction and Prehearing Statement, D.E. 37.<sup>3</sup>

#	Disputed Claim Term	Plaintiffs’ Proposed Construction	Defendant’s Proposed Construction
1	“self-balancing vehicle” (claims 1, 10)	Plain and ordinary meaning. An exemplary description of the plain and ordinary meaning is, “vehicle capable of balancing itself.”	“A vehicle that remains in an upright position regardless of external forces from the ground or the user.”
2	“self-balancing” (claims 1, 10)	Plaintiffs note this truncated phrase is a subset of longer phrases construed by both parties above and below in the context of Terms 1 and 5-9 in which it appears.  Plain and ordinary meaning. An exemplary description of the plain and ordinary meaning is, “capable of balancing itself.”	“Remaining in an upright position regardless of external forces from the ground or the user.”
3	“foot placement section” (claims 1, 3, 5, 8-11, 13, 16, 17)	Plain and ordinary meaning. An exemplary description of the plain and ordinary meaning is, “section on which a foot is placed.”  Plaintiffs note this term appears	“Surface area for a user to place a foot.”

<sup>3</sup> Prior to oral argument, the parties stipulated that another word, “coupled,” did not need to be construed.

		below numerous times in Terms 4-9.	
4	“a first foot placement section and a second foot placement section that are coupled to one another and are independently rotatable” (claims 1, 10)	<p>Plaintiffs note the only disputed term in this phrase not addressed above is “independently rotatable.”</p> <p>Plain and ordinary meaning. An exemplary description of the plain and ordinary meaning is, “a first section on which a foot is placed and a second section on which a foot is placed, where the sections are joined or linked to one another and each section can be rotated without rotating the other.”</p>	“A first surface area for a user to place a foot and second surface area for a user to place a foot, the surface areas being coupled to each other and each surface area being free to rotate regardless of the position of the other surface area.”
5	“drives the first wheel toward self-balancing the first foot placement section” (claims 1, 10)	<p>Plaintiffs note this truncated phrase is a subset of a longer phrase construed by both parties below in the context of Term 7 in which it appears.</p> <p>Plain and ordinary meaning. Exemplary descriptions of the plain and ordinary meaning of this truncated phrase are provided below in the contexts in which it appears.</p>	“Drives the first wheel to keep the first surface area for a user to place a foot in an upright position regardless of external forces from the ground of the user.”
6	“drives the second wheel toward self-balancing the second foot placement section” (claims 1, 10)	<p>Plaintiffs note this truncated phrase is a subset of a longer phrase construed by both parties below in the context of Terms 8 and 9 in which it appears.</p> <p>Plain and ordinary meaning. Exemplary descriptions of the plain and ordinary meaning of this truncated phrase are provided below in the contexts in which it appears.</p>	“Drives the second wheel to keep the second surface area for a user to place a foot in an upright position regardless of external forces from the ground of the user.”
7	“control logic that drives the first wheel toward self-balancing the first foot placement	Plain and ordinary meaning. An exemplary description of the plain and ordinary meaning is, “electronic control circuitry that signals a drive motor to apply a	<p>This is a means-plus-function term.</p> <p>Function: “drives the first wheel toward self-balancing the first</p>

	<p>section in response to position data from the first sensor” (claims 1, 10)</p>	<p>force to the first wheel that acts to balance the first section on which a foot is placed in response to data regarding the position of the first sensor.”</p> <p>Should the Court construe the term “control logic” as invoking § 112, ¶ 6, the associated function would be “signaling a drive motor to apply a force to the [first/second] wheel that acts to balance the [first/second] section on which a foot is placed in response to position data.” The associated structure is enumerated in the RE964 patent specification as, for example, “control logic 150” and/or “processor/control logic 151,” as shown and described in at least 3:12-49 and Fig. 2. A person of ordinary skill in the art would have understood control logic 150 and processor/control logic 151 to comprise electronic control circuitry.</p>	<p>foot placement section in response to position data from the first sensor.”</p> <p>Structure(s), act(s), or material(s) corresponding to the term’s function: No structure corresponding to this function is disclosed.</p>
8	<p>“control logic. . . that drives the second wheel toward self-balancing the second foot placement section in response to position data from the second foot placement section” (claim 1)</p>	<p>Plain and ordinary meaning. An exemplary description of the plain and ordinary meaning is, “electronic control circuitry that signals a drive motor to apply a force to the second wheel that acts to balance the second section on which a foot is placed in response to data regarding the position of the second section on which a foot is placed.”</p> <p>Should the Court construe the term “control logic” as invoking § 112, ¶ 6, the associated function would be “signaling a drive motor to apply a force to the [first/second] wheel that acts to balance the [first/second] section on</p>	<p>This is a means-plus-function term.</p> <p>Function: “drives the second wheel toward self-balancing the second foot placement section in response to position data from the second foot placement section.”</p> <p>Structure(s), act(s), or material(s) corresponding to the term’s function: No structure corresponding to this function is disclosed.</p>

		<p>which a foot is placed in response to position data.” The associated structure is enumerated in the RE964 patent specification as, for example, “control logic 150” and/or “processor/control logic 151,” as shown and described in at least 3:12-49 and Fig. 2. A person of ordinary skill in the art would have understood control logic 150 and processor/control logic 151 to comprise electronic control circuitry.</p>	
9	<p>“control logic. . . that drives the second wheel toward self-balancing the second foot placement section in response to position data from the second sensor” (claim 10)</p>	<p>Plain and ordinary meaning. An exemplary description of the plain and ordinary meaning is, “electronic control circuitry that signals a drive motor to apply a force to the second wheel that acts to balance the second section on which a foot is placed in response to data regarding the position of the second sensor.”</p> <p>Should the Court construe the term “control logic” as invoking § 112, ¶ 6, the associated function would be “signaling a drive motor to apply a force to the [first/second] wheel that acts to balance the [first/second] section on which a foot is placed in response to position data.” The associated structure is enumerated in the RE964 patent specification as, for example, “control logic 150” and/or “processor/control logic 151,” as shown and described in at least 3:12-49 and Fig. 2. A person of ordinary skill in the art would have understood control logic 150 and processor/control logic 151 to comprise electronic control circuitry.</p>	<p>This is a means-plus-function term.</p> <p>Function: “drives the second wheel toward self-balancing the second foot placement section in response to position data from the second sensor.”</p> <p>Structure(s), act(s), or material(s) corresponding to the term’s function: No structure corresponding to this function is disclosed.</p>



**b. ‘278 Patent**

As noted, RE964 is a reissue of Chen’s ‘278 Patent, which was filed on February 11, 2013 and issued on May 27, 2014. D.E. 63-2 at 2. The ‘278 Patent was challenged by a third-party who asserted that certain claims within the ‘278 Patent were unpatentable. D.E. 63-15 at 5. The matter was brought before the United States Patent and Trademark Office’s (“USPTO”) Patent Trial and Appeal Board (“PTAB”), which issued a written decision on March 16, 2017, and declined to institute an *inter partes* review. *Id.* at 1-2. The PTAB concluded that the petitioner who challenged the patentability of the ‘278 Patent failed to show a reasonable likelihood of prevailing with respect to any of the challenged claims on the proposed grounds. *Id.* at 19.

The ‘278 Patent was also the subject of a claim construction hearing before the United States International Trade Commission (“ITC”). D.E. 62-10. Following the hearing, the Administrative Law Judge’s (“ALJ”) November 1, 2016 written opinion rejected the argument that “control logic” was a means-plus-function limitation and gave the term its “plain and ordinary meaning, which is ‘electronic control circuitry.’” *Id.* at 13-14. Additionally, “foot placement section” was construed to have its plain and ordinary meaning. *Id.* at 18. The ALJ rejected the argument that a foot placement section must be located on the top of the machine. *Id.* at 17.

On May 26, 2017, the ITC issued an “Initial Determination on Violation of Section 337 and Recommended Determination on Remedy and Bond” for the ‘278 Patent. D.E. 63-11. The ITC considered the term “from the second foot placement section,” and determined that the cavity in which the position data sensors are located is not part of the foot placement section. *Id.* at 32-33. The ALJ found that while a foot placement section *can* include internal components, such as sensors, it need not *always* include the internal components. *Id.* The ITC concluded that (1) the “‘foot placement section’ is the area on which the rider must place his or her foot to operate the

device”; (2) “position sensors in the accused products are not located within this foot placement section”; and (3) the Complainants “failed to establish that the control unit receives position data from the second foot placement section for these [allegedly infringing] products.” *Id.* at 33-35. As a result, the ITC found no infringement of Claim 1. *Id.* at 37.<sup>4</sup>

## II. PROCEDURAL HISTORY

Plaintiffs filed their Complaint on May 24, 2019. D.E. 1. The Complaint alleges two claims against Defendant: (1) patent infringement of RE964, pursuant to 35 U.S.C. § 271; and (2) patent infringement of the D906 Patent, pursuant to 35 U.S.C. § 271. *Id.* at ¶¶ 19-62. Defendant filed an Answer, which also raised defenses and asserted two counterclaims: (1) non-infringement, and (2) invalidity. D.E. 10. Plaintiffs filed an Answer to the counterclaims on August 6, 2019. D.E. 17.

On September 17, 2020, Plaintiffs filed an Amended Complaint, D.E. 100, to which Defendant filed an Answer that raised the same two counterclaims of non-infringement and invalidity, D.E. 101. Plaintiffs filed an Answer to the counterclaims on October 15, 2020. D.E. 104.

As to claims construction, the parties filed a Joint Claim Construction and Prehearing Statement. D.E. 37. Defendant then filed a Markman Opening Brief, D.E. 61, and a corrected version was later filed on June 2, 2020, D.E. 63. Plaintiffs also initially filed their Markman Opening Brief, D.E. 62, and then submitted an amended opening brief. D.E. 85. Plaintiffs and

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<sup>4</sup> Plaintiffs indicate that they are appealing this determination; but, if this finding stands, it appears that Plaintiffs attempted to remedy the issue through the language change between Claims 1 and 10 – *i.e.*, “in response to position data *from the second sensor*” in Claim 10 versus “in response to position data *from the second foot placement section*” in Claim 1. *Id.* at 36; RE964, 5:35-36, 6:30-31.

Defendant both filed response briefs. D.E. 87, 88. This Court held a claims construction hearing on December 16 and 21, 2020. D.E. 123, 124.

### III. LEGAL STANDARD

“It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). “The purpose of claim construction is to ‘determin[e] the meaning and scope of the patent claims asserted to be infringed.’” *O2 Micro Int’l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1360 (Fed. Cir. 2008) (alteration in original) (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995) (en banc), *aff’d*, 517 U.S. 370 (1996).).

“[T]he ultimate question of construction [is] a legal question” that must be resolved by the court. *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 574 U.S. 318, 333 (2015); *see also O2 Micro*, 521 F.3d at 1360 (citing *Markman*, 52 F.3d at 979). It is therefore the court’s duty to resolve a dispute between the parties regarding the scope of a claim term. *Eon Corp. IP Holdings LLC v. Silver Spring Networks, Inc.*, 815 F.3d 1314, 1318 (Fed. Cir. 2016). At the same time, “a court need not attempt the impossible task of resolving all questions of meaning with absolute, univocal finality.” *Eon*, 815 F.3d at 1318. Rather, “only those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.” *Vivid Techs., Inc. v. Am. Science & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999). Thus, during claim construction, “courts should not resolve questions that do not go to claim scope, but instead go to infringement, or improper attorney argument.” *Eon*, 815 F.3d at 1319 (internal citations omitted).

The Federal Circuit has “frequently stated that the words of a claim ‘are generally given their ordinary and customary meaning.’” *Phillips*, 415 F.3d at 1312 (quoting *Vitronics Corp. v. Conceptronic*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). A term’s ordinary and customary meaning is what a person of ordinary skill in the art would understand the term to mean as of the patent’s effective filing date. *Id.* at 1313. This is an objective inquiry and “court[s] look[] to those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean,” including “the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art.” *Innova*, 381 F.3d at 1116. When a claim term is susceptible to more than one ordinary meaning, or when its ordinary meaning fails to resolve the parties’ dispute, “[a] determination that a claim term ‘needs no construction’ or has the ‘plain and ordinary meaning’ may be inadequate.” *O2 Micro*, 521 F.3d at 1361.

A court begins its claim construction “with an examination of the intrinsic evidence, *i.e.*, the claims, the other portions of the specification, and the prosecution history (if any, and if in evidence).” *Altiris, Inc. v. Symantec Corp.*, 318 F.3d 1363, 1369 (Fed. Cir. 2003). When examining a particular claim, “the context in which a term is used” “can be highly instructive.” *Phillips*, 415 F.3d at 1314. Additionally, the patent’s other claims – both asserted and unasserted – can “be valuable sources of enlightenment as to the meaning of a claim term.” *Id.* “[C]laim terms are normally used consistently throughout the patent,” therefore, “the usage of a term in one claim can often illuminate the meaning of the same term in other claims.” *Id.* For example, if a dependent claim adds a particular limitation, it is presumed “that the limitation in question is not present in the independent claim.” *Id.* at 1314-15.

In addition, because the claims do not stand alone and “are part of ‘a fully integrated written instrument,’ . . . claims ‘must be read in view of the specification, of which they are a part.’” *Id.* at 1315 (quoting *Markman*, 52 F.3d at 978, 979). The specification, which “contains a written description of the invention which must be clear and complete enough to enable those of ordinary skill in the art to make and use it,” “is always highly relevant to the claim construction analysis.” *Vitronics*, 90 F.3d at 1582. It is usually dispositive and “is the single best guide to the meaning of a disputed term.” *Id.* In some instances, “the specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess,” and in those cases, “the inventor’s lexicography governs.” *Phillips*, 415 F.3d at 1316. Additionally, “the specification may reveal an intentional disclaimer, or disavowal, of claim scope by the inventor,” and in such a case, “the inventor has dictated the correct claim scope, and the inventor’s intention, as expressed in the specification, is regarded as dispositive.” *Id.* “A construction that would exclude the preferred embodiment ‘is rarely, if ever, correct and would require highly persuasive evidentiary support.’” *Hill-Rom Servs., Inc. v. Stryker Corp.*, 755 F.3d 1367, 1379 (Fed. Cir. 2014) (quoting *Vitronics*, 90 F.3d at 1583).

Courts “should also consider the patent’s prosecution history, if it is in evidence.” *Markman*, 52 F.3d at 980. However, “because the prosecution history represents an ongoing negotiation between the [US]PTO and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful for claim construction purposes.” *Phillips*, 415 F.3d at 1317. If a conflict arises between the patent’s claims and specification when compared to the prosecution history, the claims and specification control. *Telcordia Techs., Inc. v. Cisco Sys., Inc.*, 612 F.3d 1365, 1375 (Fed. Cir. 2010) (finding that the

“prosecution history comments cannot trump the plain language of the claims and the direct teaching of the specification”).

“In most situations, an analysis of the intrinsic evidence alone will resolve any ambiguity in a disputed claim term,” and “it is improper to rely on extrinsic evidence.” *Vitronics*, 90 F.3d at 1583. However, “[t]he court may, in its discretion, receive extrinsic evidence in order ‘to aid the court in coming to a correct conclusion’ as to the ‘true meaning of the language employed’ in the patent.” *Markman*, 52 F.3d at 980 (quoting *Seymour v. Osborne*, 78 U.S. 516, 546 (1871)). “Extrinsic evidence consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises.” *Id.* Dictionaries and treatises can aid in claim construction by helping a court “‘better understand the underlying technology’ and the way in which one of skill in the art might use the claim terms.” *Phillips*, 415 F.3d at 1318 (quoting *Vitronics*, 90 F.3d at 1584 n.6). Expert testimony can help by providing background on the technology or explaining how an invention works, ensuring that the court understands the patent’s technical aspects “consistent with that of a person of skill in the art” and establishing “that a particular term in the patent or the prior art has a particular meaning in the pertinent field.” *Id.* However, “expert reports and testimony is generated at the time of and for the purpose of litigation and thus can suffer from bias that is not present in intrinsic evidence.” *Id.* Thus, extrinsic evidence is viewed “generally as less reliable than the patent and its prosecution history in determining how to read claim terms.” *Id.* While such evidence can assist a court, “it is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence.” *Id.* at 1319.

#### IV. ANALYSIS

##### a. “Self-balancing” and “Self-balancing Vehicle”

Plaintiffs assert that “self-balancing” has a plain and ordinary meaning easily understood by a lay person, and that “[a]n exemplary definition . . . is ‘capable of balancing itself.’” *Razor Br.* at 11. Plaintiffs also contend that the word “vehicle” does not need construction and the Court’s construction of “self-balancing” will determine the meaning of both terms. *Id.* Defendant urges that “self-balancing vehicle” be construed as “[a] vehicle that remains in an upright position regardless of external forces from the ground of the user.” *DGL Br.* at 15.

“Self-balancing vehicle” appears twice in each independent claim – claims 1 and 10 – but the term is not reasserted in any dependent claims. RE964, 5:31-36, 6:26-29. The specification uses the term “self-balancing vehicle” numerous times. *E.g.*, 1:23; 1:32; 1:44; 1:63; 1:67; 2:14; 2:17; 2:20; 2:25; 2:36; 2:42; 2:47; 2:53; 4:26; 4:36; 4:45; 4:66. However, Chen – the inventor – did not act as his own lexicographer and the specification includes no “intentional disclaimer, or disavowal, of claim scope,” with respect to the term. *Phillips*, 415 F.3d at 1316.

The Court disagrees with Defendant’s proposed construction of “self-balancing.” While Defendant’s definition would require the vehicle to remain “in an upright position,” the word “upright” does not appear in the claims or specification, and Defendant offers no other evidence in support of this construction.<sup>5</sup> The Court also disagrees with Defendant’s proposed language “regardless of external forces from the ground or the user.” Again, such a broad and absolute statement does not find support in the claims or the specifications. The patent does not claim that

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<sup>5</sup> “Upright” also introduces potential ambiguity. The invention clearly states that the platform sections or areas are independently movable. If one or both of those sections or areas were moved, Defendant’s construction could lead to a conclusion that those sections or areas were no longer upright.

the vehicle will maintain its balance regardless of ground forces such as an earthquake or a pothole. Likewise, the patent does not claim that the vehicle will self-balance despite any misuse or abuse by the user.

Defendant asserts that its construction does not require a vehicle to perform “physically impossible acts.” DGL Resp. Br. at 11. Yet, by including the word “regardless,” this is precisely what Defendant’s proposed construction does. And even if it did not so require, Defendant’s argument begs the question: what exactly is a physically impossible act for a self-balancing vehicle? Obviously, the invention is limited by the laws of physics, but the Court does not envision the trial extending to a debate on the limitations that physics impose on this invention. The laws of physics could be said to be an inherent limitation on every invention. Plaintiffs and Defendant agree that the Segway is a good example of a self-balancing vehicle; but the Segway Patent does not indicate that it can remain upright regardless of external forces.

Defendant further avers that “self-balancing” is a technical term, evidenced by its “highly technical description” both in RE964 and the Segway Patent. DGL Resp. Br. at 7; *see* DGL Br. at 16-18. Defendant points to the shut-off sensors, position sensors, and motors that are required for a vehicle to self-balance and suggests that the requirement of these technical components to achieve self-balancing makes “self-balancing” a technical term. DGL Resp. Br. at 7-8. The Court disagrees with Defendant’s position and notes that Defendant has failed to provide any legal support to indicate that a term may only be defined by reference to all the technology or other means of which it is comprised. In fact, Defendant’s own proposed construction does not go so far.

Defendant also objects to Plaintiffs’ use of the word “capable,” and relies on *Eon* to support its contention that “capable of” “improperly broadens the limitation.” DGL Resp. Br. at 8-9. But



the circumstances of *Eon* were far different. *Eon* concerned three patents that “relate[d] to a two-way interactive communication network system for enabling communications between local subscribers and a base station.” 815 F.3d at 1316. In the claims that were found to be infringed, the requisite subscriber unit was “required to be either ‘portable’ or ‘movable.’” *Id.* at 1317. These two terms were important because in the allegedly infringing system, the subscriber units were attached to the exterior walls of buildings and could not be moved without serious effort. *Id.* The Federal Circuit ruled that the district court erred in not construing these terms and instead giving each term its plain and ordinary meaning. *Id.* at 1319.

Before the district court, Eon argued that the words “portable” and “mobile” did not require construction and could be given their plain and ordinary meaning; the defendant sought a construction of these terms that did “not cover fixed or stationary products that are only theoretically capable of being moved.” *Id.* at 1317. The district judge agreed with Eon and ruled that the terms “did not require construction because their meanings are clear in the context of the claims and will be readily understandable to the jury.” *Id.* The district judge further opined that the defendant “was ‘asking for nothing the plain and ordinary meaning of the terms cannot do on their face – distinguish from ‘stationary’ or ‘fixed.’” *Id.*

The Federal Circuit observed that, in light of the specification, “portable” and “movable” could not be construed as “anything that is theoretically capable of being moved.” *Id.* at 1321. The *Eon* Court said that the specification’s guidance on the claimed “portable” and “movable” units provided that “they are low-power, battery operated units that are easily transported between different locations in a house, office, car, or throughout a cell territory.” *Id.* As a result, the Federal Circuit concluded that when “portable” and “movable” are read in their appropriate context, they could not be construed to cover the allegedly infringing meters. *Id.* The Circuit explained that the

challenged meters were bolted down to exterior walls of buildings, “connected via a wire containing 240 volts,” and secured in place with a “locking collar” and “tamper seal.” *Id.* The court in *Eon* further observed that the challenged meters were not intended to be easily moved between buildings and typically remained in the same place for fifteen years, while also noting that “there is no evidence that a meter was ever detached from one building and reattached to another.” *Id.* 1322.

By comparison, here, Defendant fails to argue as to why “self-balancing vehicle” has more than one meaning and, critically, unlike the alleged infringer in *Eon*, Defendant gives the Court no indication of why this term is even in dispute. Defendant acknowledges that “[t]he RE694 Patent does not redefine ‘self-balancing,’ but uses the term in the same sense as the Segway Patent.” DGL Br. at 18.<sup>6</sup>

The Court construes the term “self-balancing vehicle” as “a vehicle capable of balancing itself while in use.” The Court adds “in use” because it is clear from the claim and the specification that this is when the self-balancing feature occurs – nowhere in the patent is there a reference, or even an apparent concern, to the vehicle self-balancing while not in use. For example, while not in use, the vehicle could conceivably be hung on a wall or stored in some other fashion.

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<sup>6</sup> Defendant also objects to the word “capable” because the description “would encompass any vehicle that might theoretically, in the abstract, be capable of balancing itself.” DGL Resp. Br. at 8-9. Defendant provides the example of a person tipping over a bicycle – eventually, the bicycle will “come to rest on the ground in a balanced orientation.” *Id.* The Court guesses that most tangible objects – if unable to self-balance in their intended position – would fall or come to rest in a position that was “balanced,” according to Defendant’s example. A tire, for example, could roll until it fell over. However, this far-flung example is nowhere indicated in the intrinsic evidence here.

**b. “Foot Placement Section”**

“Foot placement section” appears in claims 1, 3, 5, 8, 10, 11, 13, 16. And the plural, “foot placement sections,” appears in claims 4, 8, 9, 12, 16, 17. Plaintiffs contend that this is “a non-technical term that lay people easily understand” and asserts it should be given its plain and ordinary meaning of “section on which a foot is placed.” Razor Br. at 13. Defendant argues that the term should be construed as a “surface area for a user to place a foot.” DGL Br. at 20. Defendant cautions that a clear construction of this term is needed to instruct the jury whether the “foot placement section” is “a surface area described in the specification, or whether it may more broadly encompass a housing.” *Id.*

Claim 1 provides that the invention is “[a] two-wheel, self-balancing vehicle device, comprising: a first *foot placement section* and a second *foot placement section* that are coupled to one another and are independently rotatable along an axis passing through a first wheel and a second wheel.” RE964, 5:14-21 (emphases added). The language of this claim demonstrates that each foot placement section is independently rotatable; this suggests that the foot placement section is more than just the surface area upon which a foot is placed, as Defendant claims. Claim 5 further provides that the “device . . . further compris[es] . . . a first housing section on which the first *foot placement section* is provided.” *Id.* 5:48-50 (emphasis added). This description is consistent with a finding that the “foot placement section” refers to more than just the surface area upon which the foot is placed.

The specification makes several references to foot placement sections. *E.g.*, 2:61-64; 4:59-62; 2:56-61; 4:47-53. It first explains that “an object of the present invention [is] to provide a two-wheel, self-balancing vehicle that has independently movable foot placement sections.” *Id.* 2:16-18. Another object of the invention is “to provide such a two-wheel, self-balancing vehicle in

which the independently movable foot placement sections are used by an operator to assert independent control over the driving of the wheel associated with the respective foot placement section.” *Id.* 2:19-23. The specification further instructs that “[t]he foot placement section is preferably of sufficient size to receive the foot of a user and may include a tread or the like for traction and/or comfort.” *Id.* 2:61-64.

The specification also refers to “a foot placement section or area,” *id.* 2:59-60, and a “foot placement area,” *Id.* 4:59-62. But, importantly, the specification never refers to *surface* area. In describing Figure 1, the specification states that the vehicle has two platform sections, each of which “may include a housing formed of a bottom housing member and a top housing member,” and the “top housing members may have a foot placement section or area formed integrally therewith or affixed thereon.” *Id.* 2:56-61. The specification describes a component that embodies more than just surface area – the foot placement section is either part and parcel of the housing member or it is affixed to the housing member.

In describing Figure 4, the specification provides for a vehicle that does not have “a pivoting or rotating connection between platform sections,” and instead, “the frame or housing is made of a sturdy yet sufficiently flexible material that the two foot placement sections are effectively first and second platform sections that move independently with respect to each other for independent control of the wheels.” *Id.* 4:47-53. Further, each top housing section “may include or have attached to it a rubber coating or surface or the like in the foot placement areas to increase traction and/or comfort with the foot of a user.” *Id.* 4:59-62. Again, this language demonstrates that the “foot placement section” is more than the mere surface area of where the user places his or her foot. In order to accept a user’s foot, a foot placement section must be three-

dimensional, regardless of how thin the section is. As a result, by definition, “section” necessarily includes more than just a surface area.

In addition, with respect to Figure 1, numbers 113 and 133 label the “foot placement section[s] or area[s].” *Id.* 2:59-61. Guidance from the Code of Federal Regulations instructs that “a freestanding arrow . . . indicate[s] the entire section to which it points,” while “an arrow touching a line . . . indicate[s] the surface shown by the line looking along the direction of the arrow.” 37 C.F.R. § 1.84(r)(1)-(2). Freestanding arrows point from the numerical labels 113 and 133 to areas on Figure 1. Thus, pursuant to the regulation, these arrows indicate the entire sections to which they point.

Finally, the specifications do not indicate that foot placement sections must be located on the top housing member or that the foot placement sections were precluded from including internal components.

The Court therefore rejects Defendant’s proposed construction of “foot placement section,” and construes the term as: “a section on which a foot is placed.”

### **c. “Independently Rotatable”**

Plaintiffs argue that “independently rotatable” has an easily understood plain and ordinary meaning: “can be rotated without rotating the other.” Razor Br. at 15-16. Defendant proposes the term be construed as “being free to rotate regardless of the position of the other surface area.” DGL Br. at 20. Defendant submits that the “parties dispute whether the limitation ‘independently rotatable’ requires the sections to always, or to only occasionally, rotate independently.” DGL Resp. Br. at 14-15.

“Independently rotatable” appears in claims 1 and 10 and is used to describe the first and second foot placement sections. RE964, 5:17-20; 6:12-14. Similarly, claim 9 describes the foot

placement sections as “independently movable.” *Id.* 6:5-7. The specification also includes numerous references to components that rotate or move independently. The specification explains that “[t]he two platform sections are movably coupled to one another,” and that “[p]ivoting or rotating shaft arrangements are known in the art, and others may be used without deviating from the present invention as long as the foot placement sections may move independently.” *Id.* 3:50-61. Additionally, the vehicle might not have “a pivoting or rotating connection between platform sections,” and instead have its “frame or housing . . . made of a sturdy yet sufficiently flexible material that the two foot placement sections are effectively first and second platform sections that move independently with respect to each other for independent control of the wheels.” *Id.* 4:48-53. The specification described the prior art as having “two platforms sections” which “move in a linked or ‘dependent’ manner (for example, through a parallelogram frame, and not independently).” *Id.* 1:47-49. And in providing a summary of the invention, the specification stated that it “has independently movable foot placement sections.” *Id.* 2:17-18, 20-21, 26. Finally, the specification refers to “independently movable platform sections” in describing the drawings included in the patent. *Id.* 2:37, 42-43, 47-48.

Absent from the claims or specification is any language indicating that the foot placement section is “free to rotate regardless of the of the other” foot placement section. Similar to “self-balancing vehicle,” Defendant proposes a construction that is not supported by the intrinsic evidence and again includes the word “regardless.” Defendant’s construction of “independently rotatable” also relies on the foot placement section being defined as the surface area. But more than a mere surface area must be able to rotate.

Therefore, the Court will construe “independently rotatable” as “can be rotated without rotating the other.”

**d. “Drives” and “Control Logic”<sup>7</sup>**

The parties dispute the phrase “control logic that drives the [first/second/second] wheel towards self-balancing the [first/second/second] foot placement section in response to position data from the [first sensor/second foot placement section/second sensor].” Razor Br. at 18. Plaintiffs submit that each disputed term within this phrase should be given its plain and ordinary meaning – “drives” should be construed as “signals a drive motor to apply a force”; and “control logic” should be construed as “electronic control circuitry.” *Id.* at 19.

DGL argues that the term “drives” should not be “construed as part of the larger control logic term.” DGL Br. at 24. Instead, DGL proposes that “drives the [first/second] wheel toward self-balancing the [first/second] foot placement section” should be construed as “drives the [first/second] wheel to keep the [first/second] surface area for a user to place a foot in an upright position regardless of external forces from the ground of the user.” *Id.* DGL explains that its construction of “drives” relies on “(1) the use of the term ‘drives’ in context” and “(2) its proposed constructions of the ‘foot placement section’ terms and, in addition, ‘self-balancing.’” *Id.* DGL further contends that the phrase “control logic that drives the [first/second] wheel toward self-balancing the [first/second] foot placement section in response to position data from the [first/second] sensor” is a means-plus-function term. *Id.* at 22.

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<sup>7</sup> The parties also indicate that they dispute the term “position data from.” Plaintiffs urge the Court to adopt their proposed construction of “position data” as “the position of the respective section sensed by the associated sensor,” and argue that, whether referring to “position data from a foot placement section” or “position data from a sensor,” the definition remains unchanged. Razor Br. at 28. Defendant, however, does not propose a specific construction of this term but rather views it in the context of the longer phrase of “control logic that drives the [first/second/second] wheel toward self-balancing the [first/second/second] foot placement section in response to position data from the [first sensor/second foot placement section/second sensor].” As a result, it does not appear that the parties actually dispute the proper construction of the term “position data from” and, accordingly, the Court does not construe it herein.

The construction of the disputed phrase hinges on whether “control logic” is a means-plus-function limitation as DGL contends, or whether it is a structural limitation that can simply be defined as “electronic control circuitry” as urged by Razor. DGL argues that the “control logic” limitations do not recite a sufficiently definite structure and, instead, “recite pure function.” *Id.* at 25-26. DGL continues that “logic” is a “nonce word or generic placeholder” substituted for the word “means” and that, therefore, the “control logic” terms should be construed under 35 U.S.C. § 112, ¶ 6. *Id.* at 26. Further, DGL asserts, “control logic” fails to “connote any definite structure or impart any structural significance,” and neither the drawings nor specification explains “what control logic is or how it works.” *Id.* at 26-27. “Control logic” is also an indefinite term, according to DGL, because RE964 fails to disclose an algorithm for performing the recited functions. *Id.* at 29.

Razor asserts that “control logic” is a structural limitation and not a means-plus-function limitation. Razor Br. at 20. Because the limitation does not use the word “means,” “control logic” is presumed to *not* be a means-plus-function limitation. *Id.* Razor continues that claims 6 and 14 state locations of control logics – by ascribing a physical location to each control logic, the claim indicates that each is a physical structure. *Id.* at 21. Additionally, Razor argues, the specification describes “control logic” as a structural limitation and the prosecution history and extrinsic evidence further confirm this. *Id.* at 22-24.

“Control logic” appears in claims 1, 6, 10, and 14. Claim 1 refers to “control logic that drives the first wheel toward self-balancing the first foot placement section in response to position data from the first sensor and that drives the second wheel toward self-balancing the second foot placement section in response to position data from the second foot placement section.” RE694, 5:31-36. Claim 6 describes a device “wherein the control logic include a first control logic



controlling the first drive motor located in the first housing section and a second control logic controlling the second drive motor located in the second housing section.” *Id.* 5:56-60. In claim 10, the patent describes a vehicle with “control logic that drives the first wheel toward self-balancing the first foot placement section in response to position data from the first sensor and that drives the second wheel toward self-balancing the second foot placement section in response to position data from the second sensor.” *Id.* 6:26-31. Finally, claim 14 discusses a device “wherein the control logic include a first control logic controlling the first drive motor located in the first housing section and a second control logic controlling the second drive motor located in the second housing section.” *Id.* 6:49-53.

The term “control logic” is also used in the specification. First, in describing Figure 2, the specification explains that the “control logic for translating position data to motor drive signals may be centralized or split between the two platform sections. For example, the control logic may be electrically connected to sensors and to drive motors with electrical conduits connecting through the connecting shaft between sensor, control logic, and drive motor.” *Id.* 3:22-29. The specification continues to explain that, “[a]lternatively, a separate processor/control logic may be provided in the second platform section.” *Id.* 3:30-31. Further, “if the platform sections have separate and independent control logic, . . . processing units may still share information with one another, such as status, safe operation information, etc.” *Id.* 3:46-49. The specification also states that “[w]hen a user falls off [the vehicle], the absence of the rider is sensed and the control logic, in response, stops driving the wheels such that the vehicle comes to a stop.” *Id.* 4:17-20. Finally, the specification describes that “[c]ontrol logic receives the sensed position information and drives the associated wheel toward self-balancing,” and “the control logic may be independent, provided in each platform section, or centralized, provided in one section.” *Id.* 4:34-38.

As for extrinsic evidence, Razor submits that the Microsoft Computer Dictionary defines “control logic” as “[t]he electronic circuitry that generates, interprets, and uses control data.” D.E. 62-7; Razor Br. at 24.<sup>8</sup>

#### **i. Means-Plus-Function Legal Standard**

A claim term is deemed a means-plus-function term when it invokes 35 U.S.C. § 112, ¶ 6, which state as follows:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.<sup>9</sup>

In enacting this provision, “Congress struck a balance between allowing patentees to express a claim limitation by reciting a function to be performed rather than by reciting structure for performing that function, while placing specific constraints on how such a limitation is to be construed.” *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1347 (Fed. Cir. 2015). “In return for generic claiming ability, the applicant must indicate in the specification what structure constitutes the means.” *Biomedino, LLC v. Waters Techs. Corp.*, 490 F.3d 946, 948 (Fed. Cir. 2007).

A means-plus-function limitation “is construed ‘to cover the corresponding structure, materials, or acts described in the specification and equivalents thereof.’” *Northrop Grumman Corp. v. Intel Corp.*, 325 F.3d 1346, 1350 (Fed. Cir. 2003) (quoting *Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc.*, 145 F.3d 1303, 1307-08 (Fed. Cir. 1998)). Construing a

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<sup>8</sup> This is the only extrinsic evidence relied on by either party during the proceeding.

<sup>9</sup> Paragraph 6 of Section 112 was replaced with newly designated Section 112(f) by the America Invents Act (AIA), Pub. L. No. 112-29. The change is applicable to patent applications filed on or after September 16, 2012. Here, the parties agree that paragraph 6 applies, so the Court cites to paragraph 6. The Court’s analysis would be the same under either paragraph 6 or subsection (f).

means-plus-function claim term is a two-step process. First, a court must identify the claimed function. *Williamson*, 792 F.3d at 1351 (citing *Noah Sys., Inc. v. Intuit Inc.*, 675 F.3d 1302, 1311 (Fed.Cir.2012)). Second, the court must determine what structure, if any, disclosed in the specification corresponds to the claimed function. *Id.* The second inquiry is necessary to determine whether the claim term is indefinite.

If a means-plus-function limitation is applicable, it must meet the definiteness requirement of 35 U.S.C. § 112, ¶ 2,<sup>10</sup> which provides as follows: “The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.” To assess definiteness, “claims are to be read in light of the patent’s specification and prosecution history.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 908 (2014). The scope of a claim limitation must be defined by the structure disclosed in the specification, plus any equivalents of that structure. Without such structure (disclosed in the specification to perform those functions), the claim limitation would lack specificity and render the claim invalid for indefiniteness under 35 U.S.C. § 112, ¶ 2. *See In re Donaldson Co.*, 16 F.3d 1189, 1195 (Fed. Cir. 1994); *see also Biomedino*, 490 F.3d at 950 (explaining that for a means-plus-function claim to meet the definiteness requirement, the specification must clearly link or associate structure to the claimed function).

When assessing the applicability of § 112, ¶ 6 to a claim limitation, the Federal Circuit “has long recognized the importance of the presence or absence of the word ‘means.’” *Williamson*, 792 F.3d at 1348. The presence of “means” creates a rebuttable presumption that § 112, ¶ 6 applies, while the absence of “means” creates a rebuttable presumption that it does not. *Id.* Despite these

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<sup>10</sup> The AIA replaced § 112, ¶ 2 with § 112(b). Because the parties refer to the pre-AIA designations in their briefs, the Court will do the same. The Court’s analysis would be the same under either paragraph 6 or subsection (b).

presumptions, form is never “blindly elevated” over substance, and the presence or absence of “means” does not automatically dictate whether the claim limitation is a means-plus-function element. *Id.* “Generic terms such as ‘mechanism,’ ‘element,’ ‘device,’ and other nonce words that reflect nothing more than verbal constructs may be used in a claim in a manner that is tantamount to using the word ‘means’ because they ‘typically do not connote sufficiently definite structure’ and therefore may invoke § 112, para. 6.” *Id.* at 1350 (quoting *Mass. Inst. of Tech. & Elecs. for Imaging, Inc. v. Abacus Software*, 462 F.3d 1344, 1354 (Fed.Cir.2006)). Thus, even if a claim term does not use the word “means,” § 112, ¶ 6 “will apply if the challenger demonstrates that the claim term fails to ‘recite[] sufficiently definite structure’ or else recites ‘function without reciting sufficient structure for performing that function.’” *Id.* (quoting *Watts v. XL Sys., Inc.*, 232 F.3d 877, 880 (Fed. Cir. 2000)).

Previously, the Federal Circuit ruled that “the presumption flowing from the absence of the term ‘means’ is a strong one that is not readily overcome.” *Id.* at 1348-49 (discussing *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 1358 (Fed. Cir. 2004); *Inventio AG v. ThyssenKrupp Elevator Ams. Corp.*, 649 F.3d 1350, 1358 (Fed. Cir. 2011); *Flo Healthcare Solutions, LLC v. Kappos*, 697 F.3d 1367, 1374 (Fed. Cir. 2012); and *Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1297 (Fed. Cir. 2014)). But in *Williamson*, the Federal Circuit retreated from this strong presumption and concluded that “such a heightened burden is unjustified and that [the court] should abandon characterizing as ‘strong’ the presumption that a limitation lacking the word ‘means’ is not subject to § 112, para. 6.” *Id.* at 1349. The *Williamson* Court further instructed that, going forward, it would “apply the presumption . . . without requiring any heightened evidentiary showing and expressly overrule the characterization of that presumption as ‘strong.’” *Id.*

Thus, the presumption can be overcome and § 112, ¶ 6 will apply “if the challenger demonstrates that the claim term fails to recite sufficiently definite structure or else recites the function without reciting sufficient structure for performing that function.” *Zeroclick, LLC v. Apple Inc.*, 891 F.3d 1003, 1007 (Fed. Cir. 2018) (quoting *Williamson*, 792 F.3d at 1348). In other words, the party challenging the presumption bears the burden by a preponderance of the evidence. *Id.* (citations omitted). The standard for determining “definite structure” is “whether the words of the claim are understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the name for structure.” *Williamson*, 792 F.3d at 1348. “That determination must be made under the traditional claim construction principles, on an element-by-element basis, and in light of evidence intrinsic and extrinsic to the asserted patents.” *Id.*

## **ii. Means-Plus-Function Standard as to Computer and Electronic Words/Terms**

Without the word “means,” whether computer related words and terms overcome the presumption that § 112, ¶ 6 is inapplicable depends on how a person of ordinary skill in the art would understand the words or terms. Words such as computer, microprocessor, processor, program, or user interface code will not be considered nonce words and will not rebut the presumption that § 112(f) does not apply if a person of ordinary skill in the art can “reasonably discern” from the claim language that the words (computer, microprocessor, processor, program, and/or user interface) are a specific reference to conventional items “existing in the prior art at the time of the” invention. *Zeroclick*, 891 F.3d at 1008. Similarly, functions such as “processing,” “receiving,” and “storing” that can be achieved by any general purpose computer without special programming do not require disclosure of more structure than the general purpose processor that performs those functions. *In re Katz Interactive Call Processing Patent Litig.*, 639 F.3d 1303, 1316 (Fed. Cir. 2011).

The Federal Circuit has also found that words like “circuit” or “circuitry” can indicate sufficiently definite structure to avoid application of § 112, ¶ 6. *See Abacus*, 462 F.3d at 1354-56; *Linear Tech. Corp. v. Impala Linear Corp.*, 379 F.3d 1311, 1320-21 (Fed. Cir. 2004); *Apex Inc. v. Raritan Comput., Inc.*, 325 F.3d 1364, 1372 (Fed. Cir. 2003). The Circuit has found that the word “circuit,” coupled with a description in the claims of the circuit’s operation, generally conveys the structural arrangement of the circuit’s components. *See Abacus*, 462 F.3d at 1355; *Linear Tech.*, 379 F.3d at 1320; *Apex*, 325 F.3d at 1373. Likewise, a “controller,” will not necessarily be indefinite even if the internal circuitry is not described in the specification. *Telcordia*, 612 F.3d at 1377. If a person of ordinary skill in the art would understand how to build the controller, then the internal circuitry does not need to be disclosed. *Id.*

If, however, a person of ordinary skill in the art cannot reasonably determine from the claim language that the words (computer, microprocessor, processor, program, and/or user interface) are a specific reference to conventional items existing in the prior art at the time of the invention, then the presumption that § 112, ¶ 6 does not apply can be overcome. In other words, if the claims and specification make clear that a general purpose computer must be programmed to “perform particular functions pursuant to instructions from program software,” then a written description which essentially refers to a general purpose computer is insufficient. *Williamson*, 792 F.3d at 1352. In such a case, a patent’s specification must “disclose an algorithm for performing the claimed function.” *Id.* The algorithm may be “expressed as a mathematical formula, in prose, or as a flow chart, or in any other manner that provides sufficient structure.” *Id.* Vague references like “appropriate programming,” however, are insufficient. *Aristocrat Techs. Austl. PTY Ltd. v. Int’l Game Tech.*, 521 F.3d 1328, 1334 (Fed. Cir. 2008). Additionally, a mathematical formula

describing the *outcome* of a performed function is insufficient – the algorithm must describe how the function is performed. *Id.* at 1334.<sup>11</sup>

In *Zeroclick*, the Federal Circuit overturned the district court’s finding of means-plus-function claiming. In that case, the patents concerned “modifications to the graphical user interfaces of devices such as computers and mobile phones, modifications that allow the interfaces to be controlled using pre-defined pointer or touch movements instead of mouse clicks.” *Zeroclick*, 891 F.3d at 1005. The challenged limitations failed to use the word “means” so it was presumed that § 112, ¶ 6 did not apply. *Id.* at 1008. The Federal Circuit determined that the lower court had effectively treated the words “program” and “user interface code” as nonce words. *Id.* at 1008. The Circuit found that because the challenger provided no evidentiary support for its argument, it failed to carry its burden and the presumption remained unrebutted. *Id.*

The Circuit also found the lower court’s approach erroneous for three reasons: (1) “the mere fact that the disputed limitations incorporate functional language does not automatically convert the words into means for performing such functions”; (2) the [district] court’s analysis removed the terms from their context, which otherwise strongly suggests the plain and ordinary meaning of the terms”; and (3) “the district court made no pertinent finding that compels the conclusion that a conventional graphical user interface program or code is used in common parlance as substitute for ‘means.’” *Id.* at 1008-09. As to the second error, the Federal Circuit determined that when viewed in context, and considered alongside the descriptions of the prior art

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<sup>11</sup> In *Aristocrat*, the Federal Circuit found that Aristocrat had conflated enablement under § 112, ¶ 1 with the requirements of § 112, ¶ 6. *Aristocrat*, 521 F.3d at 1336. The Federal Circuit explained that “[e]nablement of a device requires only the disclosure of sufficient information so that a person of ordinary skill in the art could make and use the device. A section 112 paragraph 6 disclosure, however, serves the very different purpose of limiting the scope of the claim to the particular structure disclosed, together with equivalents.” *Id.*

and the “written descriptions supporting the asserted claims,” the challenged terms were “used not as generic terms or black box recitations of structure or abstractions, but rather as specific references to conventional graphical user interface programs or code.” *Id.* at 1008.

The Federal Circuit reached the opposite conclusion in *Williamson*. In that case, the relevant patent concerned “methods and systems for ‘distributed learning’ that utilize industry standard computer hardware and software linked by a network to provide a classroom or auditorium-like metaphor – *i.e.*, a ‘virtual classroom’ environment.” 792 F.3d at 1343. At issue was the word “module” (as part of the term “distributed learning control module”), which the *Williamson* court found to be a “well-known nonce word” which can be a substitute for “means.” *Id.* at 1350. The Circuit continued that “the claim does not describe how the ‘distributed learning control module’ interacts with other components in the distributed learning control server in a way that might inform the structural character of the limitation-in-question or otherwise impart structure to the ‘distributed learning control module’ as recited in the claim.” *Id.* at 1351. The court in *Williamson* concluded that presumption against means-plus-function claiming was rebutted. *Id.*

The Federal Circuit next found that the distributed learning control module required a “special purpose computer,” meaning a “general purpose computer programmed to perform particular functions pursuant to instructions from program software.” *Id.* at 1352. A special purpose computer was required, the *Williamson* court continued, “because the distributed learning control module has specialized functions as outlined in the written description.” *Id.* The Circuit therefore found that the specification was required to disclose an algorithm for performing the claimed function. *Id.* (citation omitted). The court in *Williamson* concluded that because the specification did not have the required algorithm, the relevant claims were indefinite. *Id.* at 1354.



As noted, here, one of the contested words is “logic,” which was also considered in *HealthSpot, Inc. v. Computerized Screening, Inc.*, No. 14-cv-804, 2015 WL 1523960, \*1 (N.D. Ohio Apr. 2, 2015). At issue in that case were “health kiosks,” which “generally are machines that allow for medical services, such as blood pressure testing, to be performed at locations other than doctors’ offices.” *Id.* at \*1. The court considered seven disputed terms involving “logic”: (1) Claim 10: “Logic for Controlling Storage of the User Health Test Result in the Local Storage in a User Local Storage Element Allocated for the User”; (2) Claim 11: “Logic for Controlling Storage of the Health Test Result in the Remote Storage in a User Remote Storage Element Allocated for the User”; (3) Claim 12: “Logic for Controlling the Health Test Interface to Perform Measurements on a User to Acquire User Health Test Measurement Data”; (4) Claim 13: “Logic for Processing the User Health Test Measurement Data to Generate a User Health Test Result”; (5) Claim 14: “Logic for Controlling Display of the User Health Test Result and a Health Test Result History via the User-Interactive Display”; (6) Claim 15: “Logic, at Least Partly Executable on the Controller and at Least Partly Executable on the Remote Server, Providing Access to Health-Related Information via the Interactive Display”; and (7) Claim 16: “Logic for Receiving from the Remote Server Health-Related Services and Information.” *Id.*

Ultimately, the district court determined that these “logic” terms were means-plus-function terms. *Id.* at \*12. The *HealthSpot* court noted that, although the claims did not include the word “means,” the presumption was overcome. *Id.* The Court also indicated that “the patent [gave] no disclosure of the algorithm or type of program to be used to carry out the basic logic functions.” *Id.* at \*12.

### iii. Means-Plus-Function Analysis

#### a. “Drives”

As noted, the parties dispute the proper construction of “drives” and the context in which to evaluate the term. Plaintiffs propose that “control logic that drives” be construed as “electronic control circuitry that signals a drive motor to apply a force.” Razor Br. at 19. DGL argues that “drives the [first/second] wheel toward self-balancing the [first/second] foot placement section” be construed as “drives the [first/second] wheel to keep the [first/second] surface area for a user to place a foot in an upright position regardless of external forces from the ground of the user.” DGL Br. at 24.

The Court finds Defendant’s proposed construction problematic because it is an extension of Defendant’s flawed proposal to construe “self-balancing vehicle” as “[a] vehicle that remains in an upright position regardless of external forces from the ground of the user.” DGL Br. at 15. “Upright” does not appear in the claims or specification, and “regardless of external forces” is a broad and absolute statement that does not find support in the claims or the specifications.

Plaintiffs’ proposed construction better comports with language in the specification. For example, the specification states that a control logic “is connected directly to a sensor and drive motor and *generates drive signals to the motor (and wheel) based on data from sensor,*” RE964 3:30-35 (emphasis added), and that control logic “receives the sensed position information and *drives the associated wheel toward self-balancing,*” *id.* 4:34-36 (emphasis added).

Nevertheless, in light of the Court’s construction of control logic, the Court does not find that the additional language proposed by Plaintiffs is unnecessary for proper construction of “drives.” Both sides agree that “drives” is used as a verb. *Id.*; see Razor Br. at 27-28.

Therefore, the Court determines that “drives” is subject to its plain and ordinary meaning.

### **b. “Control Logic”**

The parties dispute whether “control logic” is a means-plus-function term. The word “means” is absent and, therefore, the Court begins with the presumption that § 116, ¶ 6 does not apply. The Court must next determine whether Defendant has met its burden by showing that the limitation, as understood by one of ordinary skill in the art, demonstrates that the claim term “fails to ‘recite sufficiently definite structure’ or recites a ‘function without reciting sufficient structure for performing that function.’” *Linear Tech.*, 379 F.3d at 1319 (quoting *Watts v. XL Sys., Inc.*, 232 F.3d 877, 880 (Fed. Cir. 2000)). Like the rulings in *Telcordia* and *Zeroclick*, the Court finds that Defendant has not overcome the presumption because it has failed to show that a person of ordinary skill in the art would understand “control logic” as means-plus-function claiming.

Defendant’s opening Markman Brief spends much time reviewing the Segway Patent and includes a “force diagram” which demonstrates how the Segway maintains self-balancing. DGL Br. at 15-18. Importantly, Defendant’s brief also states that “[t]he RE964 Patent does not purport to improve upon the self-balancing feature of the well-known, prior art Segway,” *id.* at 3, and acknowledges that “[t]he Segway Patent is . . . part of the intrinsic record of the RE964 Patent,” *id.* at 15. The Court agrees that the RE964 Patent does not purport to improve on the self-balancing feature of the Segway. Instead, the focus of the RE964 Patent is to “provide[] independent wheel control” for a “two-wheel self-balancing vehicle.” RE964, 1:63-64. Thus, while Defendant reviews in detail the self-balancing technology of the Segway, which is part of the prior art, Defendant likewise concedes that the RE964 Patent does not assert that it improves on such self-balancing technology.

Plaintiff provided the only extrinsic evidence in this case – the Microsoft Computer Dictionary’s definition of “control logic”: “[t]he electronic circuitry that generates, interprets, and

uses control data.” D.E. 62-7; Razor Br. at 24. To understand whether a term recites sufficient structure, courts “examine whether it has an understood meaning in the art.” *Linear Tech*, 379 F.3d at 1320 (quoting *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1369 (Fed. Cir. 2002)). Technical dictionaries “are evidence of the understandings of persons of skill in the technical arts,” and are therefore useful in this inquiry. *Id.* (citing *Tex. Digital Sys., Inc. v. Telegenix, Inc.*, 308 F.3d 1193, 1202 (Fed. Cir. 2002) (“Dictionaries are always available to the court to aid in the task of determining meanings that would have been attributed by those of skill in the relevant art to any disputed terms used by the inventor in the claims.”)). As a result, the definition provided supports a finding that “control logic” means “electronic control circuitry.” Likewise, the Court finds the ITC decision persuasive, which rejected the argument that “control logic” was a means-plus-function limitation and construed the term as “electronic control circuitry” in accordance with its plain and ordinary meaning. D.E. 62-10 at 13-14.

Whether a term is a means-plus-function limitation is a fact sensitive inquiry, based on the claim, the context in which the term is used, and the specification. *Zeroclick*, 891 F.3d at 1008 (finding that the lower court failed to consider a claim in context when the district judge decided that means-plus-function claiming applied). If it is clear that some kind of specialized software would be needed to perform a function, then the limitation is properly construed as a means-plus-function limitation. *See HealthSpot*, 2015 WL 1523960, \*12 (finding that the disputed logic terms invoked means-plus-function claiming because reciting the physical structure of a computer is insufficient to avoid means-plus-function claiming). However, if it is not readily apparent that special software is needed, the burden falls on the party seeking means-plus-function construction to demonstrate why an algorithm is needed. For example, in *Telcordia*, Telcordia – the patent holder – presented expert testimony “that an ordinary artisan would know how to interpret the

specification and actually build a circuit.” 612 F.3d at 1377. The Federal Circuit explained that “the specification need only disclose adequate defining structure to render the bounds of the claim understandable to an ordinary artisan.” *Id.* The Circuit continued that “patents are presumed to be valid” and the party seeking to invalidate Telcordia’s patents, Cisco, had “the burden of proving that an ordinary artisan would not understand the disclosure”; Cisco failed to meet this burden. *Id.*

Similarly, the Federal Circuit concluded in *Linear Tech* that “circuit” and “circuitry” limitations were not means-plus-function limitations. *Linear Tech* involved “voltage regulators, which are designed to provide a predetermined and constant voltage output from a fluctuating input voltage source, such as a battery, to an energy consuming device, called a ‘load.’” *Linear Tech*, 379 F.3d at 1316. Certain kinds of voltage regulators – the “switching type” – “transmit power to the load in discrete current pulses” and “[t]o ensure a steady flow of current pulses, control circuitry is used to turn the transistors on and off.” *Id.* On appeal to the Federal Circuit, the parties “dispute[d] whether the ‘circuit’ and ‘circuitry’ limitations” in certain independent claims were means-plus-function limitations.” *Id.* at 1319. The Federal Circuit ruled that the district court erred in concluding these terms were means-plus-function limitations. *Id.* at 1320-21. The Federal Circuit found that “circuit” and “circuitry” were established as terms that a skilled artisan would understand to connote structure, and explained that the district court erred in failing to require the party who sought means-plus-function construction to rebut the presumption that these were not means-plus-function terms. *Id.*

The *Linear Tech* court first examined how an individual of ordinary skill in the art would understand the disputed terms by reviewing technical dictionaries. *Id.* at 1320. One dictionary cited by the court “define[d] ‘circuit’ as ‘the combination of a number of electrical devices and conductors that, when interconnected to form a conducting path, fulfill some desired function.’”

*Id.* The Circuit determined that “circuit” is a “structure-connoting term” that conveys sufficient structural meaning to a person of ordinary skill in the art when “coupled with a description of the circuit’s operation” and § 112, ¶ 6 presumptively did not apply. *Id.* Next, the court in *Linear Tech* looked to the claim language in the patent and found that “persons of ordinary skill in the art would understand the structural arrangements of circuit components from the term ‘circuit’ coupled with the qualifying language of [the relevant claim]” – the same conclusion reached by an expert witness before the district court. *Id.* The Federal Circuit highlighted that the “circuit” limitations were “accompanied by . . . language reciting their respective objectives or operations.” *Id.* The *Linear Tech* court found that “because the term ‘circuit’ is used in each of the disputed limitations . . . with a recitation of the respective circuit’s operation in sufficient detail to suggest structure to persons of ordinary skill in the art, the ‘circuit’ and ‘circuitry’ limitations . . . are not means-plus-function limitations.” *Id.* at 1320-21.

Similarly, here, the relevant claims and specification provide “objectives or operations” for “control logic.” For example, claim 10 states that control logic “drives the first wheel toward self-balancing the first foot placement section in response to position data from the first sensor,” thereby assigning an objective or operation to the control logic. RE964, 6:26-28. Additionally, in Figure 2, control logics are labeled as “150” and “151” and depicted as boxes. The specification text describing this image indicates that the control logic “is connected directly to sensor 140 and drive motor 137 and generates drive signals to motor 137 (and wheel 135) based on data from sensor 140.” *Id.* 3:30-35. Defendant has thus failed to demonstrate that “control logic” would not suggest sufficient structure to a person of ordinary skill in the art. *Cf. Telcordia*, 612 F.3d at 1377 (Fed. Cir. 2010) (finding that if a person of ordinary skill in the art would understand how to build the “controller,” then the internal circuitry does not need to be disclosed).

Defendant argues in a conclusory fashion that Figure 2 depicts control logic as a “black box,” arguing that it is “a square devoid of structure that imparts no information about what the control logic is or how it works.” DGL Br. at 27. Nevertheless, as the Federal Circuit explained in *Telcordia*, “the specification need only disclose adequate defining structure to render the bounds of the claim understandable to an ordinary artisan” and determined that depicting a “controller’s circuit as a black box” did “not automatically render the claim indefinite.” *Telcordia*, 612 F.3d at 1377 (quoting *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1338 (Fed. Cir. 2008)). The Circuit ruled that so long as “an ordinary artisan would have recognized the controller as an electronic device with a known structure,” “the specification along with the figures shows sufficient structure to define the claim terms for an ordinarily artisan in the relevant field.” *Id.*

Defendant continues that a software algorithm is needed to instruct the control logic to drive the wheels towards self-balancing the foot placement sections in response to position data, and that RE964 does not disclose or describe any circuitry – essentially, Defendant argues that control logic is an empty box. DGL Br. at 29-30. *Telcordia* also involved a controller’s circuit depicted as a black box (*i.e.*, nothing showed its internal circuitry).<sup>12</sup> But the critical question is not whether the internal circuitry is disclosed; rather, it is whether a person of ordinary skill in the art would understand how to build it. *Telcordia*, 612 F.3d at 1377. To this end, Defendant has not presented sufficient evidence in support of its argument.

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<sup>12</sup> Defendant also cites, in a footnote, the Northern District of California’s decision in *Zeroclick v. Apple Inc.*, No. 15-4417, 2016 WL 5477115 (N.D. Cal. Aug. 16, 2016) for the proposition that “user interface code” provides a “black box recitation of structure.” DGL Br. at 27 (quoting 2016 WL 5477115, \*6). However, the Federal Circuit vacated and remanded the district court’s decision in this case, and specifically pointed to the provision cited in DGL’s brief as an example of the district court “couch[ing]” its determination “in conclusory language” and not giving legal effect to the unrebutted presumption created by the absence of the word “means.” *Zeroclick*, 891 F.3d at 1008.

Similarly, Defendant argues that the control logic is a computer-implemented limitation and there is no algorithm for performing the claimed functions received in the control logic limitations. D.E. 124, 6:20-25. In support of this argument, Defendant cites *Aristocrat* for the proposition that merely referring to a general-purpose computer or simply reciting “software” is not an adequate disclosure of the corresponding structure that performs a function. DGL Br. at 29-30. *Aristocrat* provides that “[i]n cases involving a computer-implemented invention *in which the inventor has invoked means-plus-function claiming*, [the Federal Circuit] has consistently required that the structure disclosed in the specification be more than simply a general purpose computer or microprocessor.” *Aristocrat*, 521 F.3d at 1333 (emphasis added). Defendant, however, places the cart before the horse because Defendant must first prove that the presumption (that Plaintiff did not invoke means-plus-function claiming) has been overcome.

Defendant further argues that referring to “control logic” as a “processor” fails to provide sufficient structure and cites *GoDaddy.com* in support of this contention. DGL Br. at 26. While Defendant is correct that *GoDaddy.com* concluded that a skilled artisan “would understand ‘processor’ to mean a general purpose computer” rather than “a name of a sufficiently definite structure,” the court went on to explain that “if the functions performed by the processor are functions typically found in a commercially available off-the-shelf processor, then a skilled artisan might understand the term ‘processor’ to provide sufficient structure for performing those functions.” 2016 WL 212676, at \*56. Here, Defendant has failed to present sufficient evidence that a skilled artisan would not be able to do so.

Defendant further relies upon *HealthSpot* as an example in which “the court construed a number of terms beginning with ‘logic’” and “concluded the patent at issue ‘gives no disclosure of the algorithm or type of program used to carry out the basic logic functions.’” *Id.* at 26. But



*HealthSpot* involved a very different invention from the one at issue in the present matter – one for “health kiosks” that allow medical services, like blood pressure testing to be performed at non-doctors’ office locations. *HealthSpot*, 2015 WL 1523960, \*1. At issue in *HealthSpot* were a series of logic terms “for accomplishing a particular task,” for example “Logic for Controlling Storage of the User Health Test Result in the Local Storage in a User Local Storage Element Allocated for the User,” and “Logic for Controlling Display of the User Health Test Result and a Health Test Result History via the User-Interactive Display.” *Id.* at \*1, \*12. The court determined that these logic terms merely “recit[ed] the physical structure of a computer-or, in this case, a controller,” which was insufficient “to avoid means plus function claiming.” *Id.* at \*12. Thus, based on the claims, the context, and the specifications, the court was able to ascertain that these logic terms described functions that required software. The court explained that that the structural component of computer software is understood to one of skill in the art by an algorithm, a set of specific instructions or rules, or a flowchart. *Id.* Here, it is not apparent from RE964’s claims, context, and specification that “control logic” is a means-plus-function limitation. Additionally, Razor has provided evidence to the contrary from a technical dictionary which demonstrates that a person of ordinary skill in the art would understand “control logic” as a structural, rather than a means-plus-function term. And DGL has failed to put forth adequate evidence to rebut this presumption.

As directed by the Federal Circuit, context is important. *Zeroclick*, 891 F.3d at 1008. Thus, while Defendant has pointed to cases in which “logic” or other computer terms/words were found to result in means-plus-function claiming, the context of those cases (the claims, the specifications, and prior art) demanded such a result. Ultimately, Defendant fails to meet its burden here.

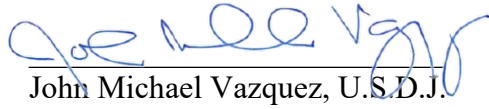
For the foregoing reasons, the Court construes “control logic” as “electronic control circuitry.”

### C. CONCLUSION

For the reasons explained above, the Court construes the disputed terms of the RE964 Patent as follows:

- Self-balancing vehicle: a vehicle capable of balancing itself while in use.
- Foot placement section: a section on which a foot is placed.
- Independently rotatable: can be rotated without rotating the other.
- Drives: plain and ordinary meaning.
- Control logic: electronic control circuitry.

Dated: February 19, 2021

  
John Michael Vazquez, U.S.D.J.